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super lattices is converted into a mixed crystal by the impurity induced disordering based upon one of impurity diffusion and impurity ion implantation, to divide the super lattice into a first region formed of the mixed crystal and a second region having the super lattice structure.

Yoshida describes a planar semiconductor optical device for modulating an optical beam that includes an active layer provided on a substrate, the active layer having a quantum structure and being laterally surrounded by an optical confinement region which has a refractive index smaller than the effective refractive index of the active layer.

In order to support a rejection under 35 U.S.C. §102, every limitation must be shown or suggested in the claims. Applicants note that the present claims are directed in particular to a Vertical Cavity Surface Emitting Laser (VCSEL), neither of which is shown or disclosed in Fukuzawa or Yoshida. The Examiner states, at pages 3 and 4, that the devices of Fukuzawa and Yoshida are 'inherently' VCSELs to the extent claimed by applicant. Applicant disagrees, but has amended claim 1 to include structure that further defines a typical VCSEL by including a 'top mirror' and 'bottom mirror' 'top spacer' and 'bottom spacer' to the claim. Since neither Fukuzawa nor Yoshida disclose 'a top mirror' and a 'bottom mirror' as recited in the claims, the rejections have been overcome and should be withdrawn. Claim 2 serves to further limit claim 1 and is allowable for at least the reasons put forth with regard to claim 1.

Rejections under 35 U.S.C. §103

Claims 3-11 were rejected under 35 U.S.C. §103 as being unpatentable over Yoshida in view of Jewell (U.S. 5,822,356). Applicants note that claim 3 has been cancelled, with the

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limitations of claim 3 having been moved to claim 1, and thus Applicants will address the rejection with regard to newly amended claim 1.

Jewell describes an improved lens structure which reduces the scattering or reflection losses in an optical cavity. The lens comprising at least a first, second and third lens layer arranged vertically, the first and third lens layers being oxidized in first and third oxidized regions, the second layer disposed between the first and third layers and comprising a non-oxidized semiconductor material, each of the oxidized regions having an aluminum contents greater than 20% and approximately spacing the first lens layer from the third lens layer to reduce the scattering and/or reflection losses in the optical cavity.

The Examiner states that it would have been obvious to one of ordinary skill in the art to modify Yoshida by employing top and bottom spacers as taught by Jewell, so as to gain the advantageous benefit of separating the respective mirrors from the gain region. Applicant respectfully disagrees. Yoshida specifically teaches that "the window 26a has a size comparable to the lateral size of the MQW mesa structure. Thereby, substantially the entirety of the optical beam that has entered the device through window 26a is confined in the mesa structure and radiated from the lower window 25a after optical modulation... As a result, the optical loss can be reduced significantly..." Thus, Yoshida is tightly designed to achieve a specific purpose, and Applicants suggest that the modification suggested by the Examiner of including top and bottom spacers into the design of Yoshida would serve to frustrate Yoshida. Accordingly, for at least this reason, Yoshida and Jewell are not a proper combination and the rejection under 35 U.S.C. §103 should be withdrawn. Claims 4-11 serve to further limit claim 1 and are therefore allowable with claim 1.

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Applicants have made a diligent effort to place the claims in condition for allowance. However, should there remain unresolved issues that require adverse action, it is respectfully requested that the Examiner telephone Lindsay G. McGuinness, Applicants' Attorney at 978-264-6664 so that such issues may be resolved as expeditiously as possible.

For these reasons, and in view of the above amendments, this application is now considered to be in condition for allowance and such action is earnestly solicited.

Respectfully Submitted,

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Date

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